इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 8709 (1977): Method of test for colour retention of vitreous enamel coatings [CHD 9: Ceramicware]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS : 8709 - 1977
(Reaffirmed 2006)

Indian Standard

METHOD OF TEST FOR COLOUR RETENTION OF VITREOUS ENAMEL COATINGS

UDC 667.636.24:667.622.118.485.11:535.686

© *Copyright* 1978

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

June 1978

AMENDMENT NO. 1 JUNE 2007
TO
IS 8709 : 1977 METHOD OF TEST FOR COLOUR RETENTION OF VITREOUS ENAMEL COATINGS

(*Page* 3, *clause* **2.1**, *line* 1) — Substitute 'IS 2717 : 1979* *for* 'IS : 2717 - 1964*'.

(*Page* 3, *footnote marked* *) — Substitute the following for the existing:

'*Glossary of terms relating to vitreous enamelware and ceramic-metal systems (*first revision*).'

(*Page* **4**, *clause* **6.1**, *line* 2) — Substitute 'IS 261 : 1982†' *for* 'IS : 261 - 1966†'.

(*Page* 4, *footnote marked* †) — Substitute the following for the existing:

'†Specification for copper sulphate (*second revision*).'

(*Page* **4**, *clause* **6.1**, *line* 3) — Substitute 'IS 1070 : 1992‡' *for* 'IS : 1070 - 1977‡.

(*Page* **4**, *footnote marked* ‡) — Substitute the following for the existing:

'‡Reagent grade water — Specification (*third revision*).'

(CHD 9)

Reprography Unit, BIS, New Delhi, India

IS : 8709 - 1977

Indian Standard

METHOD OF TEST FOR COLOUR RETENTION OF VITREOUS ENAMEL COATINGS

Ceramicware Sectional Committee, CDC 27

Chairman	*Representing*
DR S. P. VARMA	Directorate General of Technical Development, New Delhi
Members	
SHRI D. S. CHABHAL (*Alternate* to Dr S. P. Varma)	
ASSISTANT DIRECTOR (MS), RDSO	Railway Board (Ministry of Railways)
DR S. K. BANERJEE	Directorate of Industries, Government of West Bengal, Calcutta
SHRI G. K. BHAGAT	Bengal Potteries Ltd, Calcutta
SHRI L. S. BHARAJ	Ministry of Defence (R & D)
SHRI K. K. BHATIA	U.P. Ceramics & Potteries Ltd, Ghaziabad
SHRI A. K. BHATIA (*Alternate*)	
SHRI N. D. DAVDA	All India Pottery Manufacturers' Association, Calcutta
SHRI S. K. GHOSH (*Alternate*)	
SHRI S. DEB	Associated Porcelain Pvt Ltd, Calcutta
SHRI O. P. DHAMIJA	Export Inspection Council of India, Calcutta
SHRI D. P. AHUJA (*Alternate*)	
SHRI M. K. GANPULE	The Parshuram Pottery Works Co Ltd, Wankaner
SHRI R. R. DEO (*Alternate*)	
SHRI K. K. GHAI	Ministry of Defence (DGI)
DR S. P. SINGH DHAKAREY (*Alternate*)	
DR S. K. GUHA	Central Glass & Ceramic Research Institute (CSIR), Calcutta
SHRI P. T. JACOB	Kerala Ceramics Ltd, Kundara
SHRI R. M. MEHRA	Bombay Potteries and Tiles Ltd, Bombay
SHRI D. P. NIYOGI	Sur Enamel & Stamping Works Pvt Ltd, Calcutta
SHRI PRONOB KUMAR SUR (*Alternate*)	
SHRI E. K. RAMACHANDRAN	National Test House, Calcutta
SHRI G. C. DAS (*Alternate*)	
SHRI P. JAGANATH RAO	E.I.D.-Parry Ltd, Ranipet

(*Continued on page* 2)

© *Copyright* 1978

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Members	*Representing*
DR B. M. SEDALIA	Development Commissioner, Small Scale Industries, New Delhi
SHRI P. SUR	Vitreous Enamellers' Association, Calcutta
DR G. M. SAXENA, Director (Chem)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI G. P. SARASWAT
Deputy Director (Chem), ISI

Ceramic-Metal Systems Subcommittee, CDC 27:4

Convener	
SHRI S. S. VERMA	Central Glass & Ceramic Research Institute (CSIR), Calcutta

Members	
SHRI G. M. AGARWAL	Ferro Coatings & Colours Ltd, Calcutta
SHRI D. S. CHABHAL	Directorate General of Technical Development, New Delhi
SHRI D. P. NIYOGI	Sur Enamel and Stamping Works Pvt Ltd, Calcutta
SHRI S. K. SUR (*Alternate*)	
DR B. V. SUBBA RAO	Ministry of Defence (Metallurgical Research Laboratory & Directorate of Research in Basic Sciences)
SHRI G. R. K. MURTHY (*Alternate*)	
SHRI A. K. SEN	Bengal Enamel Works Ltd. Calcutta
SHRI A. K. CHAKRABORTY (*Alternate*)	
SHRI P. SUR	Vitreous Enamellers' Association, Calcutta
SHRI B. K. CHATTERJEE (*Alternate*)	

Indian Standard

METHOD OF TEST FOR COLOUR RETENTION OF VITREOUS ENAMEL COATINGS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 10 October 1977, after the draft finalized by the Ceramicware Sectional Committee had been approved by the Chemical Division Council.

0.2 Correlation between results of the cupric sulphate test prescribed in this standard and outdoor exposure tests of enamels coloured with cadmium sulphide or cadmium sulpho-selenide pigments shows that the test is an effective indicator of the tendency for such coatings to undergo appreciable colour change during exposure to atmospheric elements. This test method is considered useful for specification acceptance, quality control and research and development purposes.

0.3 In the formulation of this standard assistance has been derived from the publication C-538-1967 'Standard method of test for colour retention of red, orange and yellow porcelain enamels', issued by the American Society for Testing and Materials (ASTM), USA.

1. SCOPE

1.1 This standard prescribes the method of test for colour retention of vitreous enamel coatings containing cadmium sulphide or cadmium sulpho-selenide type pigments.

NOTE — The purpose of the test is to detect those red, yellow, orange and some green enamels that are likely to undergo appreciable change in colour upon exposure to atmosphere.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 2717-1964* shall apply.

3. TEST SPECIMENS

3.1 Test specimens measuring not less than 50 × 50 mm shall be cut out from enamelware drawn as specified in individual material specifications. Test specimens shall be reasonably flat. They may also be prepared by firing along with the enamelware.

---

*Glossary of terms used in vitreous enamelware industry.

4. PRINCIPLE

4.1 Cupric sulphate solution is placed on the surface of the test specimen and allowed to remain there for 20 hours under controlled illumination. The surface is then washed, dried and examined visually for darkening of the colour in the area treated with cupric sulphate solution.

NOTE — In some cases, the treatment may change the gloss of the treated area. Any such change in gloss shall be ignored.

5. APPARATUS

5.1 The apparatus shall comprise a box, made of plywood or other suitable material, and having internal dimensions approximately 500 × 150 × 300 mm. The box shall be painted white on the inside and shall be fitted with a 230 V 20 W tubular fluorescent lamp [*see* IS:2418 (Part II)-1977*] in such a position that the distance inside the box, between the specimen surface and the centre line of the lamp is 287 mm. The box shall also be provided with vents for air circulation. Ventilation is accomplished by 11 holes, 13 mm in diameter drilled 25 mm apart on a centre line 25 mm from the inside top. Eleven similar holes are also drilled on a centre line 25 mm from the bottom on each of the two long sides of the box.

6. REAGENT

6.1 Cupric Sulphate Solution — Weigh 50 g of analytical reagent grade cupric sulphate ($CuSO_4.5H_2O$) (*see* IS:26l-1966†) and dissolve in 100 ml of hot distilled water (*see* IS: 1070-1977‡) in a 250-ml glass beaker and allow to age at a temperature of 27 ± 2°C for 16 hours or longer with occasional stirring.

NOTE — This ageing treatment produces a solution with some undissolved material remaining at the bottom of the beaker.

7. PROCEDURE

7.1 Clean the specimen by washing with soap and water, followed by copious rinsing with clean, but not necessarily distilled water. Dry the surface with clean dry towel by blotting or gentle rubbing.

---

*Specification for tubular fluorescent lamps for general lighting service: Part II Standard lamp data sheets (*first revision*).

†Specification for copper sulphate (*first revision*).

‡Specification for water for general laboratory use (*second revision*).

7.2 Place several drops of aged cupric sulphate solution (*see* **6.1**) on the horizontal test surface of the specimen to form a pool, and immediately cover with a clean 25-mm diameter watch-glass having fire-polished edges. The quantity of the solution used shall be sufficient to fill the inverted watch-glass except for a small bubble of entrapped air. Remove any excess solution from the test area not under the watch-glass.

NOTE — In some cases it may be necessary to seal the area of contact between the watch-glass and the specimen surface with some material, such as modelling clay or rubber cement, to prevent escape of the solution.

7.3 Place the specimen with watch-glass in position in the test chamber maintained at 27 ± 2°C and keep it in that position for 20 hours.

NOTE — If the solution escapes or dries out at the end of the test period, the test shall be ignored and repeated on a different location on the specimen surface.

7.4 After exposure, remove the watch-glass, rinse the treated area with water to remove all the test solution and dry with a clean cloth.

7.5 Visually examine the treated area immediately to determine whether there has been any darkening of the same. Use partially diffused light, supplemented, if necessary, by artificial light, the total intensity being approximately that available within a short distance from an outside window, but do not examine in direct sunlight. During observation, the specimen shall be held near a light source (such as a window) at a distance not less than the minimum width of the source.

7.6 The specimen shall be considered to have failed in the test if any darkening of the treated area in relation to the untreated area is observed. Changes in the gloss cauesd by the treatment shall be ignored.

8. REPORT

8.1 Report the type, colour, number of specimens tested, and whether each specimen passed or failed the test.

INDIAN STANDARDS ON CERAMICWARE

IS:

2717-1964	Glossary of terms used in vitreous enamelware industry
2781-1975	Glossary of terms relating to ceramicware (*first revision*)
2836-1974	Methods of test and quality requirements for porcelain laboratory apparatus (*first revision*)
2837 (Part 1)-1975	Porcelain crucibles and basins: Part I Crucibles (*first revision*)
2837 (Part II)-1977	Porcelain crucibles and basins: Part II Basins (*first revision*)
2838-1964	Stoneware containers for general purposes
2839-1964	Industrial stoneware
2840-1965	China clay for ceramic industry
2857-1976	Earthenware dinnerware (*first revision*)
3149-1968	Enamelware for home use (*first revision*)
3432-1965	Clay pipe triangles
3505-1965	Porcelain dinnerware
3936-1966	Porcelain mortars and pestles
3953-1966	High temperature ceramic combustion boats
3972-1968	Methods of test for vitreous enamelware
3990-1967	High temperature ceramic combustion tubes
4589-1968	Ball clays for ceramic industry
5009-1968	Buchner funnels
5011-1968	Gooch crucibles
6154-1971	Perforated plates for desiccators
6988-1973	Fine china dinnerware
7087-1973	Ceramic tower packings
7402 (Part I)-1974	Ceramic water filters: Part I Filter containers
7402 (Part II)-1975	Ceramic water filters: Part II Filter candles
7775-1975	Ceramic grinding media and lining
8017-1976	Vitreous enamelled reflectors for use with tungsten filament lamps
(Part I)-1977	Methods of test for vitreous enamels and frits: Part I Sieve analysis
(Part II)-1977	Methods of test for vitreous enamels and frits: Part II Fusion flow test
8709-1977	Method of test for colour retention of vitreous enamel coatings

INDIAN STANDARDS

Over 9 000 Indian Standards covering various subjects have been sued so far. Of these, the standards belonging to the Chemical Group all under the following categories:

- Acids
- Adhesives
- Alcohols and allied products
- Alkalis
- Brushware
- Ceramicware, enamelware and laboratory porcelain
- Chemical hazards and safety
- Chemicals, inorganic (miscellaneous)
- Chemicals, organic (miscellaneous)
- Coal and coke
- Coal carbonization products
- Coated fabrics
- Cosmetics and toilet goods
- Dental materials
- Drying oils
- Dye intermediates
- Electroplating chemicals
- Explosive and pyrotechnic materials
- Fertilizers
- Fillers, stoppers and putties
- Footwear
- Glass and glassware
- Industrial gases
- Inks and allied products
- Laboratory glassware thermometers and related apparatus
- Lac and lac products
- Leather, leather goods and leather dressings
- Linters and allied products
- Lubricants and related products
- Oil pastes
- Oils & fats, oleaginous seeds and fruits
- Painters' materials (miscellaneous)
- Paper and its products
- Paper and pulp board packaging materials
- Perfumery materials, natural and synthetic
- Petroleum and petroleum products
- Photographic chemicals
- Pigments and extenders
- Plastics
- Polishes
- Printing inks
- Ready mixed paints and enamels
- Rubber and rubber products
- Soaps and other surface active agents
- Tanning materials and allied products
- Thermal insulation materials
- Thinners and solvents
- Varnishes and lacquers
- Water and water treatment
- Water based paints
- Unclassified

OTHER PUBLICATIONS

Sl Bulletin (Published Every Month)	
Single Copy	Rs 4.00
Annual Subscription	Rs 36.00
Standards : Monthly Additions	
Single Copy	Re 0.30
Annual Subscription	Rs 3.00
Annual Reports (from 1948-49 Onwards)	Rs 2-00 to 7.00
SI Handbook, 1975	Rs 30.00

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephone : 27 01 31 (20 lines) **Telegrams** : **Manaksanstha**

Regional Offices:

			Telephone
Western	Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern	5 Chowrlnghee Approach	CALCUTTA 700072	23-08 02
Southern	C.I.T. Campus, Adyar	MADRAS 600020	41 24 42

Branch Offices:

Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Showhouse Bldg, Sachivalaya Marg	BHUBANESHWAR 751001	5 36 27
Ahimsa Bldg, SCO 82-83, Sector I7C	CHANDIGARH 160017	2 83 20
5-8.S6/57 L. N. Gupta Marg	HYDERABAD 500001	22 10 83
D-277 Todarmal Marg, Banipark	JAIPUR 302006	6 98 32
17/418 B Sarvodaya Nagar	KANPUR 208005	82 72
B.C.l. Bldg (3rd Floor), Gandhi Maidan East	PATNA 800004	5 36 55
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27

Printed at Britannia Calendar Mfg Co, Calcutta, India